Air Navigation Pro

User's Guide

Air Navigation

Real-time navigation system with moving map

ANDROID

for more info: www.xample.aero

Xample

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Special thanks to our Beta testers, partners and users who where invaluable in making this a better product.

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1.Introduction

Thank you for your interest in Air Navigation Pro. Air Navigation was firstly developed for Apple devices running under iOS operating system versions 4 or higher. It was developed with General Aviation in mind, however it was quickly adopted by pilots of various flying vehicles including, for example: paragliders, gliders, ultra light, single or multiengine airplanes, helicopters and even hot air balloons.
After having good impact on users from different parts of the world, we decided to take Air Navigation to the Android platform.
Our goal is to implement as many tools and features as the Apple version offers, by releasing regularly updates month by month.

Air Navigation is an affordable, yet powerful flight planning and real-time navigation application. We hope you will enjoy the product as much as we enjoyed working on it.

1.1.About this document

This document is intended to show the user all the existing tools and features Air Navigation Pro comes with and assist on how to use them.
This document might not be complete, since we release a new update very often, which means that the version of the application may be higher than the one appearing on the first page.

1.2.Minimum requirements

Air Navigation Pro will run on:

- A mobile or a tablet running
Android operating system version 2.3 or higher.

- **200 MB** of
available space for the application and database.

- approximately **350 MB** of
available space for each chart of the size of a country like France or Germany.

- A **GPS module** is mandatory for real-time navigation.
If the device does not bring an internal one, then an external GPS gadget will be required.

1.3. Disclaimer

Before using this software, you must read and agree with the following terms and conditions.

This software is not intended to replace a certified navigation device! We do not guarantee the accuracy and comprehensiveness of the information provided. The embedded navigation database is provided for informational purpose only. It may not be complete and may contain erroneous data.

You should always use official aeronautical documentation (AIP) when preparing and performing a flight. You should always use certified navigation devices when performing a flight. This software is provided 'as-is', without any express or implied warranty. In no event will the authors or third party data providers be held liable for any damages arising from the use of this software

YOUR USE OF THIS REAL TIME ROUTE GUIDANCE APPLICATION IS AT YOUR SOLE RISK. LOCATION DATA MAY NOT BE ACCURATE.

2.User Interface

2.1.Air Navigation Pro on a TABLET

On a tablet the screen is divided to display the selected route and the HSI instrument. The moving map is on the right side together with the data bar at the bottom.

Air Navigation Pro can be set to full-screen and, in this case, the route and the HSI will be hidden.

Other modules, functionalities and settings can be accessed from the top toolbar.

The following screenshot shows the different parts described above:

References:
1. Toolbar
2. Moving map
3. Data bar
4. Route module
5. HSI instrument

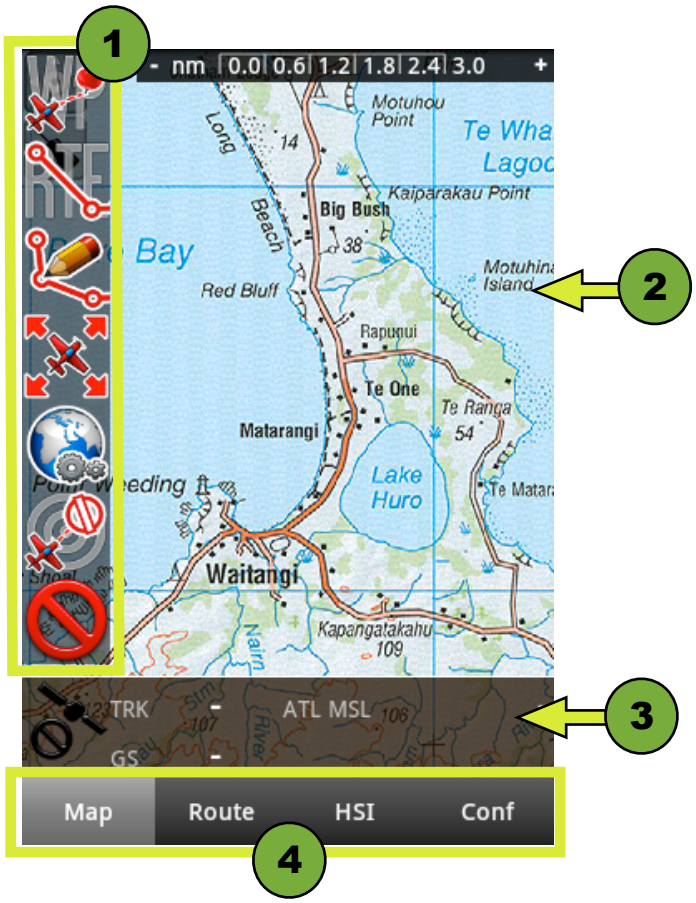
2.2.Air Navigation Pro on a MOBILE

On a mobile, one module can be displayed at a time. By default, the moving map is displayed at launch time. Other modules can be displayed by pressing the corresponding tab buttons at the bottom of the screen.

The toolbar is hidden by default and you must press the «screwdriver» button on the upper-left side to display it.

Other settings can be accessed in the **«Config»** tab in the bottom-right corner.

The following screenshot shows the different parts described above:



References:
1. Toolbar (opened)
2. Moving map
3. Data bar
4. Bottom tab bar
5. Toolbar (closed)

2.3. Buttons in the toolbar

On a mobile, this button toggles the moving map data bar visibility on/off. On a tablet, this button toggles between split-screen and full-screen mode. The split screen shows two of the selected instruments together with the moving map.

«Map options» displays the map settings module. In the map settings you can configure what will be displayed on the map and how. For example, you can turn on and off maps/charts displayed as the background.

Toggles between Flight mode and **Edit** mode. When **Edit** mode is turned on, a yellow-black bar at the top of the screen indicates it is active. It is possible to tap waypoints on the map to add/remove them to/from a current route and also press and drag a leg up to a waypoint to include it in the created route as well.

Displays the waypoint database where it is possible to search for a particular waypoint or list nearby waypoints, sorted by distance. The search can be done by Airport name, city name, ICAO code, or directly by accessing to the list of countries.

Displays the list of stored routes. Tapping on a route from the list will set this route as current, displaying the legs in the **«Route module»** and displaying the route in the moving map as a magenta-color vector.

Selects the nearest air field from your current location as a direct-to-waypoint.

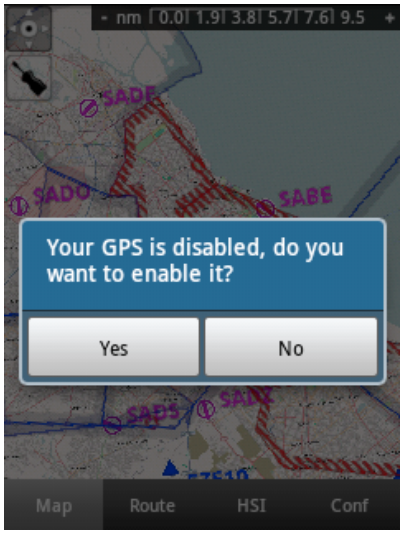
Clears the current selected route or direct-to-waypoint. Press this button when you want to set the map to «free flight» mode and/or when you want to start a new blank route.

«Configuration» button displays the application behavior and customize units and other settings. On a mobile, the settings are reachable from the «Config» tab at the bottom-right corner.

3.Setup

3.1.Starting

After installation of the application, on every launch, the system will ask to enable the GPS in case it is not.



You should **allow GPS access** to Air Navigation, otherwise realtime navigation functionalities will not work properly.

After launching Air Navigation Pro for the first time, the map should be centered to your current location. The application has an internal waypoints database and you should see waypoints in the vicinity on the map.

Please note that **no map background is installed with the application**. You can install a map background from various free of charge or commercial sources from the «MapStore» module located in the «Configuration» button on a tablet and in the «Config» tab on a mobile. You can find more information on how to install maps/charts in the next chapter.

Should you wish to change length, speed or altitude units, you can do so from the «Settings» panel.

You can also enable/disable the option for map rotation, use magnetic or true north for track and bearing and in if you are not connected to a wifi network, but you wish to download a map through GSM, you are able to do it by activating the option.

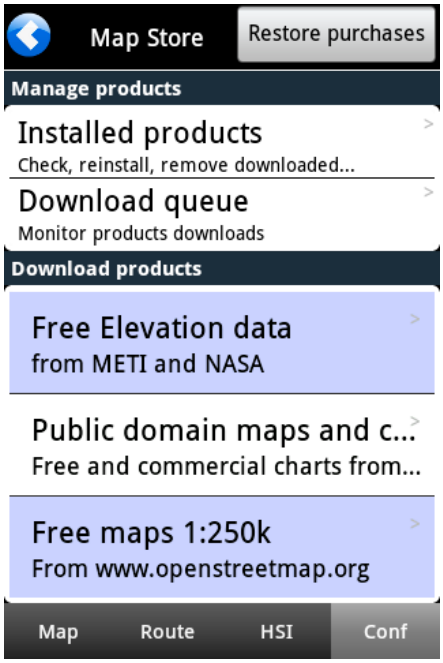
At the bottom of the Settings, you can block the “Disclaimer” message that appears when launching the application.

4.Instalation

4.1.Installing maps and charts

Commercial charts screenshots: http://www.facebook.com/AirNavShots
For **Reinstalling purchased maps** please refer to the section below current.

Free of charge open source maps, charts from the public domain and commercial charts can be installed to be used as the background image of the moving map module.
Maps/charts are downloaded from our servers from within the application. They are stored in the tablet/mobile memory and do not require an internet connection while flying.



To browse the available maps/charts catalog, choose **«MapStore»** from the «Configuration» menu (top-right button) on a tablet or from the «Config» tab on a mobile.

The **Map Store** module has 2 sections. The top section is to manage installed product. In the installed products module, it is possible to display a list of maps/charts installed on your device. It is also possible to reinstall a product in the list if it is not functioning properly. This is also where you can delete a product or parts of a product that is outdated, for example.

The «Download Queue» module lists current and pending downloads. This module is typically used to monitor download progression of a map/chart. It is possible to reorder the downloads or to remove an item from the download list.

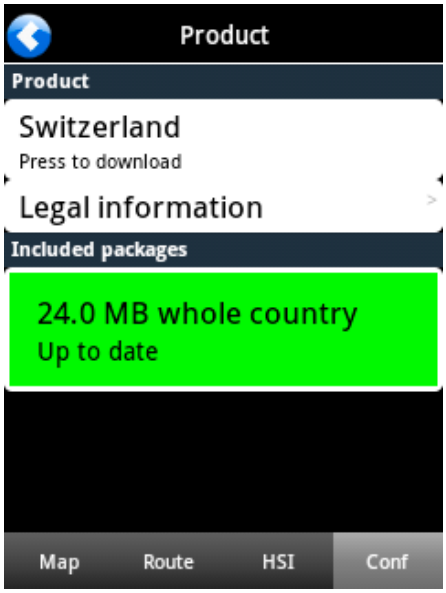
Before attempting to download a map you should check that:
- the tablet/mobile is connected to a functional Wifi network.
- **bluetooth is turned OFF**, as it can disturb the Wifi network.
- there is **enough memory** on the tablet/mobile.

The «Download products» section is a catalog of available maps/charts. You can browse the products and get information about them such as : source/ provider, country or area, product size, product price(if not-free).
Some of the commercial charts packages include more than 1 file (you can find up to 50 files in the US Sectional, WAC and TAC packages, for example). This means that it is all included in the price showing on the top. However, it is possible to install those files we need to fly with, only.

Installed packages appear in different colors according to:

- White : maps are not installed.
- **Green** : maps are installed and up to date.
- **Orange** : new version available for download.

When a particular package appears in orange, it means that an update is available. The reason could be that we have uploaded an updated version of the map or we have found an issue with the existing one and there is a fixed version ready to download.



4.2. Restore purchases

The **«Restore purchases»** button, located on the top-right corner of the «MapStore» module, is useful if you reinstalled the application and wish to reinstall the maps from the internet.

This button displays a list of purchases found on your Google Play account. You can then press on a particular chart to reinstall without paying for it again.

If you wish to install Air Navigation Pro on a new tablet/mobile, you can download the maps you purchased on the former device with this button.

In order to use the «Restore purchases» button properly, you must use the **same Google Play account** that you purchased the charts with.

5.Moving Map

5.1.The moving map

The moving map is the main instrument of Air Navigation Pro. It is used for real-time navigation as well as route planning or creation of user waypoints.

You can create a route directly from the moving map. It is possible to add intermediate waypoints to your current route during a flight (to avoid bad weather conditions for example).

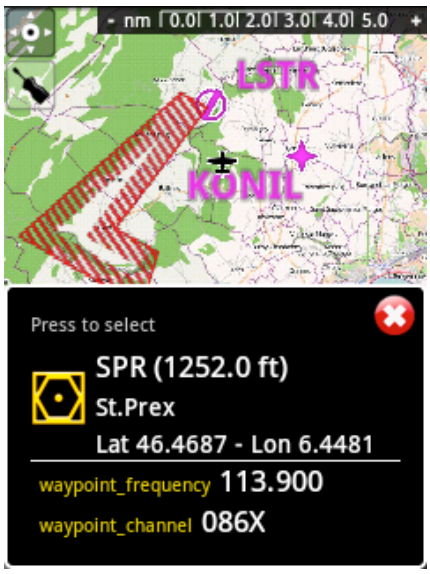
By default, the moving map is centered on your current location, north-oriented. By pressing on the symbol in the top-left corner, you can toggle between :

North-oriented, current location in the center of the screen, moving.

Track-oriented, current location ng to match current track, moving.

Panned mode.

Touching and moving the map will switch to **panned mode**. In this case the map will be moved to the location of your choice, north-oriented or pointing to any direction in case you have the option for map rotation enabled in the Settings. It will not move to follow your current location, instead, the aircraft symbol will move on the map, possibly leaving the screen area.
You can center the map again and restore map movements by pressing once on the symbol in the top-left corner.



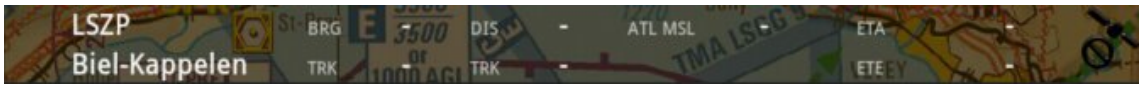
Touching an area of interest on the map will reveal a popup window with useful information. Touchable items are:

Waypoints: ID code, elevation, type symbol, full name, latitude, longitude, frequency (Navaids), runway and contact frequency info (Airports).
Airspace: lower and upper limits, name, class and additional information.

On a tablet, pressing outside the popup will hide it, on a mobile you have to press on the "close" button in the top-right corner of the popup window.

When being in Flight mode (default), pressing on the name of the waypoint (on the popup window) will ask you if you want to select this waypoint and affect it to an instrument or direct to the point in the moving map.

The data bar at the bottom of the moving map will display real-time information. From left to right: ID and name of next waypoint; bearing, track and distance of next waypoint; groundspeed and altitude as reported by the GPS signal, and estimated time to the next waypoint.



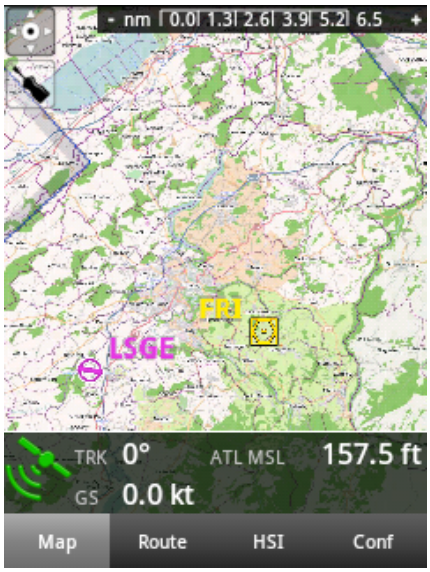
The data bar also shows a GPS signal symbol as follows:

Excelent GPS signal

Good GPS signal

Weak GPS signal

Very week GPS signal



For real time navigation, the quality of the GPS signal is required to be a **green or yellow** symbol. A red or orange symbol will only show an approximate location and will not report speed nor track information.
For better results, you should place your device near a window, with a direct view of the sky. If you are flying with a full metal airplane or your airplane is equipped with anti-ice windshield, the internal GPS of your tablet/ mobile may be a bit weak and you may need an external GPS module to assist it.

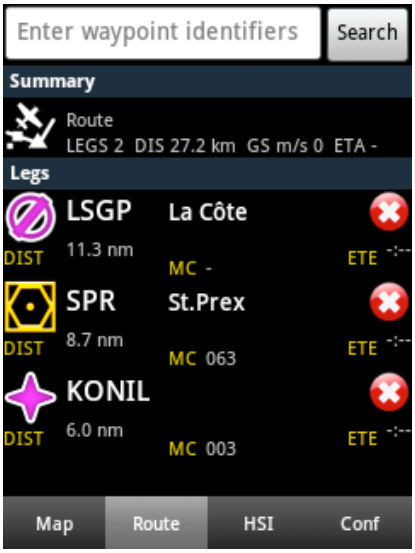
5.2. Route Planning

By default, the moving map is in «Flight mode». You can toggle the moving map from «Flight mode» to **«Edit mode»** at any time to create or amend a route by pressing on the «Edit» button in the Toolbar.

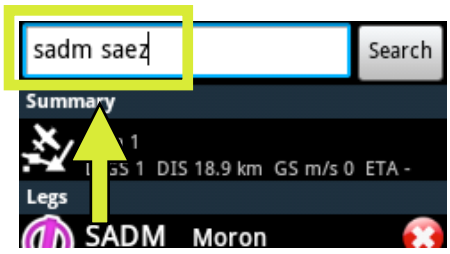
To **create a route:**

- Toggle to «edit mode», a yellow-and-black striped bar should appear at the top of the moving map. A search field will also appear on top of the «Route module».

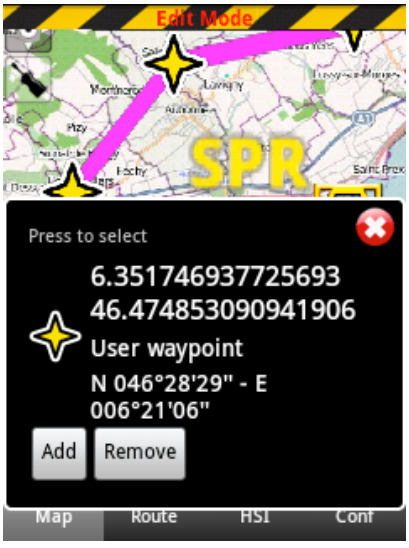
- To **add waypoints** to your route, press on waypoints of your choice on the moving map. In the waypoint popup, press on the **«add»** option. A yellow star should now appear on the moving map and your waypoint should be in the «Route» list.



- Alternatively, you can input one or more waypoint identifiers in the **«search»** field on top of the «Route module» and press on "search". Multiple identifiers must be separated by a space:

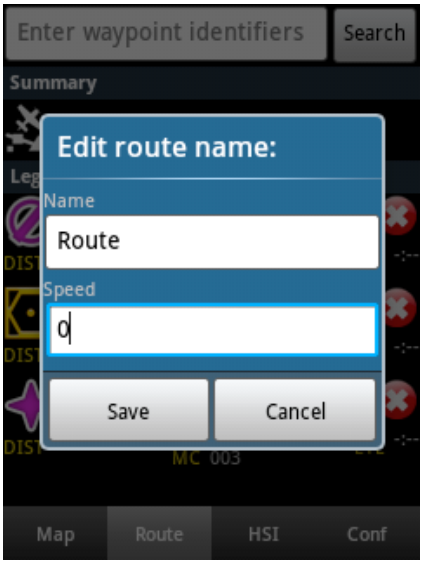


In edit mode it is also possible to **remove waypoints** from the list in the «Route module». Alternatively, you can remove a waypoint by pressing on the map and choose the **«remove»** option.



It is possible to insert a waypoint by **pressing on and dragging** the magenta vector (leg) and moving to a new location on the map. As a result, a new waypoint will be inserted in the «Route». If the location on the map is not over an existing waypoint, a «temporary» waypoint will be created named "user waypoint".

In the «Route module», you can press on the **«Summary»** line at the top of the list to write the **route name and cruise speed**. The route name is used to identify a particular route in the **«Routes list»** when they are saved. Cruise speed information will be used to display **ETA** on top of the list.

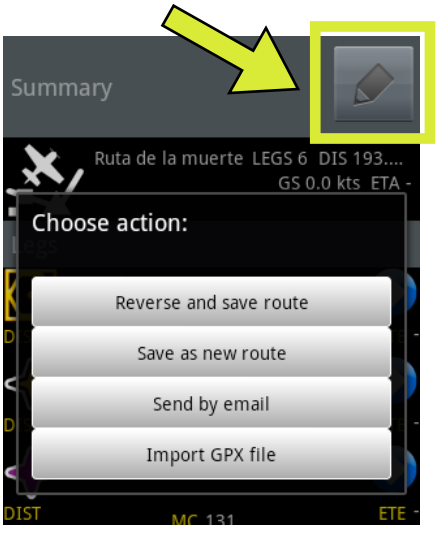


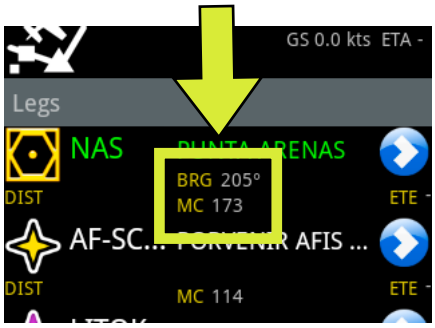
When you are satisfied with your route, you can toggle back to «Flight mode», and the route will be automatically stored in the **«Routes list»** (see screenshot on the left).

On the left-side screenshot you can see 3 routes stored as an example.
By selecting any of them from this module, Air Navigation Pro will take it as the current route on the moving map.

In order to **reverse** the Route, you should press on the upper-right button of the «Route module» as shown on the screenshot.

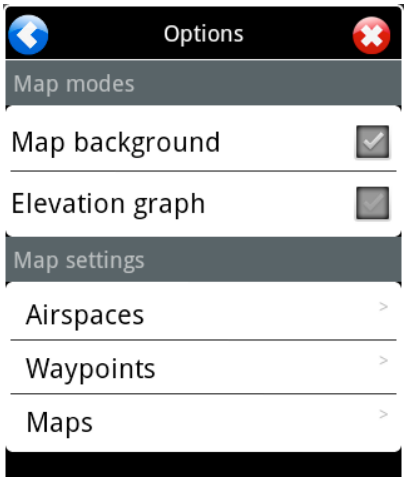
You will also have the options to save the current Route as a new one and even **send it by e-mail**.





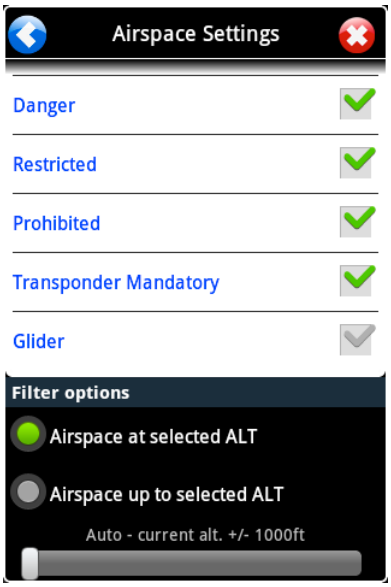
When switching back to «Flight mode», you will show on the **next** waypoint of the list the **bearing** (BRG) and **magnetic course** from your current position.

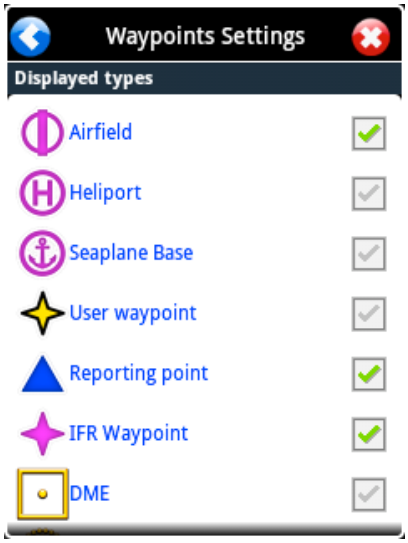
5.3. Map Options menu



From the Toolbar press on the **«Map Options»** button to access various options for the moving map.

Airspaces: Air Navigation Pro offers a complete database of interactive Airspaces (not all countries included). These Airspaces are selectable and show vertical limits, name, type and additional information such as contact frequencies. You can filter the airspaces showing in the map by “type” or “altitude”.





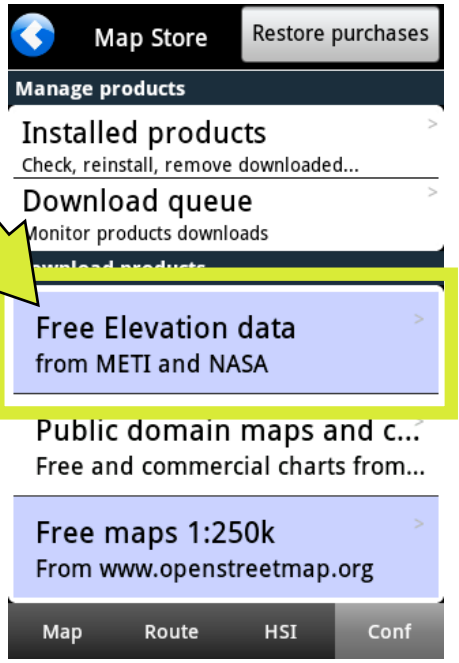
Waypoints: You can show or hide different kind of waypoints (Airfield, Heliport, IFR, VFR, NDB, VOR, TACAN, etc). Also, you have an option at the bottom of the menu that allows to filter by an airfield`s runway`s surface.

Maps: You can show or hide a downloaded map or move it above or below to make it visible in case of overlaying with another one.

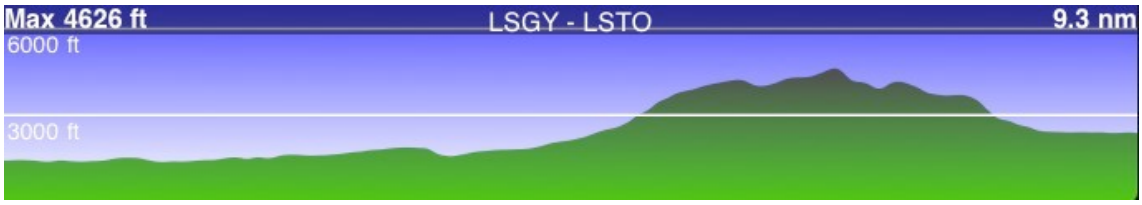
As you can see in the screenshot beside, there is a straight-squared mark on the left side of each installed map. This means that I can move them up or down by pressing and holding on that mark.
Maps from the top will be visible in case they overlay with maps from below.
For example, if Argentine maps would be overlaying with Swiss one, the former will be on top of the latter.

5.4. Elevation Graph (terrain profile)

From the «Map Options» menu, yo can turn on the Elevation Graph.If elevation data is installed for your region, the elevation graph will display terrain information. Note that you will show data information ONLY after downloading **«Free Elevation data»** files from the Map Store.



In «Flight mode», it will display the terrain in front of the aircraft, updating the view every 5 seconds. The terrain view can be **zoomed** to display 10 NM to 50 NM of terrain elevation. The maximum reported altitude will be displayed in the top left corner of the elevation view. A symbol representing your aircraft will be displayed in the view with a red dashed line, representing your current altitude, as reported by the GPS.
In **«Edit mode»,** it will display the terrain **between the two waypoints** of the selected leg. This is very useful when planning your route, to get an estimate of the minimum safe altitude.



Note: Please note that even with a good GPS signal, the altitude as reported by the GPS may have an accuracy of +/- 200 ft. Elevation database may also contains some inaccuracies. You should always plan your flight with a reasonable margin over the obstacles.

6.Instruments

Using a GPS signal Air Navigation Pro can simulate an HSI instrument. Unlike real-navigation instruments, the virtual instruments can be set-to-point to any waypoint in the database (airport, VOR/DME, user waypoint, etc).

6.1.HSI

The HSI is the most practical of all traditional nav instruments but it also requires some training before it can be used efficiently.

If the GPS reception is bad the warning flag will show that the instrument does not display correct data.

The top part of the screen is an emulated HSI (Horizontal situation indicator) . The yellow needle is the Course select pointer, the moving part in the middle is the Course deviation indicator (CDI) which displays the deviation (+/- 12 degrees) from the selected radial or course to or from the selected waypoint. Unlike on a real HSI where the orange Heading bug is used to set a course for the autopilot, the heading bug displays the bearing to the selected waypoint. Also the HSI **does not display magnetic heading but the track of the aircraft**.

The advantage of the HSI is that it displays the position of the aircraft symbol in the middle relative to the selected course. The compass card will rotate automatically to match the current flying track. Radial or course selection is done by touch and swipe gesture up or down on the left or right of the compass ring.

A **"NAV" warning flag** (as shown in the image above) will let you know that you should Not trust the HSI indicator in the following cases:

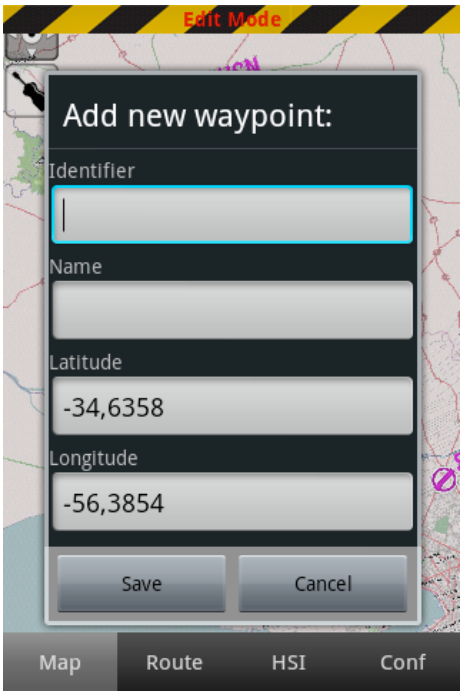
- **No waypoint** is selected for the instrument;
- the waypoint distance is **over 250 nautical miles**;
- the **GPS accuracy** is bad;
- Groudspeed is **less than 5 Kts.**

Below the main indicator, the selected waypoint is displayed as well as the distance from the waypoint (great circle distance). You can use any kind of waypoint (Airports, VOR, NDB, etc) with the HSI instrument. (A real HSI indicator requires radio signals from VOR, VOR/DME or VORTAC transmitters).

7.Other Features

7.1.Adding User Waypoints

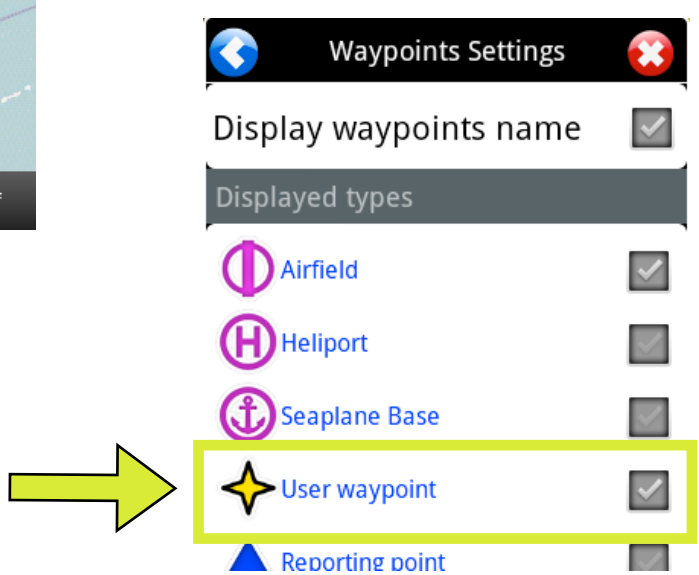
A **«user waypoint»** can be added on the «moving map» by **pressing and holding for 2 seconds** on the desired location of the map.



Remember to be in **«EDIT MODE»** before you try to add a new waypoint.

Once finished, the new user waypoint will show as a **yellow star** on the exact location you created it like the screenshot depics below.

Remember to have the waypoint type **"User Waypoint" selected** in «Map Options».



7.2. Importing/Exporting GPX files (Routes)

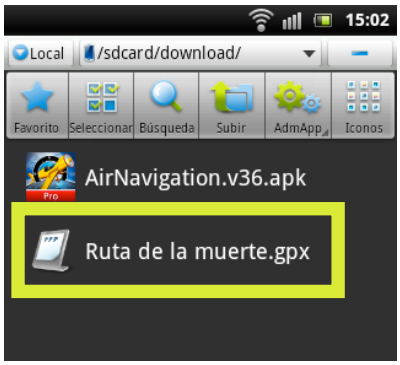
A **Route in GPX format** can be imported or exported from Air Navigation Pro.

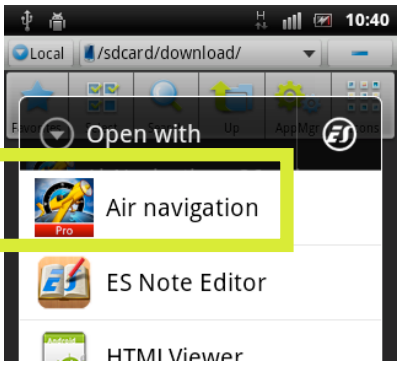
In order to **export** a Route, you should press on the upper-right button located in the «Route Module» section, then select the option "**Send by email**".

You must first have an email account configured on your device.

In oder to **import** a Route, you proceed as before and select the option "**Import GPX file**"; then you search for the file and open it as a normal file.

As another alternative, the GPX file can be executed from an Android **file browser.** The screenshots show the app "ES Explorer" browser used to open it: https://play.google.com/store/apps/details?id=com.estrongs.android.pop&hl=en





Note: You can either synch your device with a PC and copy the GPX file you wish to import into a desired folder (screenshot above)

or

you can send the GPX file to your personal email and open it directly in your device.
(Screenshot beside)

8.Getting Support

Current user manual is a work in progress, since it will be updated and completed as new features and tools are released.

In the mean time, if you don't find specific information about Air Navigation Pro, you can send us a support request from the **«support»** section of our website:

http://xample.desk.com/

We usually answer support requests within a few business days.